

## CLAIMS

What is claimed is:

1. A method for balancing server work load in a client-proxy telecommunications system having location aware communication devices comprising the steps of:
  - creating a map graph; and
  - automatically re-mapping a map graph when a threshold value has been exceeded.
2. The method of claim 1 wherein the step of mapping the system further comprises the steps of:
  - determining a number of partitions;
  - determining a plurality of communication requirements; and
  - creating a map graph having a plurality of cells, collections, and partitions.
3. The method of claim 2 wherein the step of creating the map graph further comprises the steps of:
  - creating a first layer having cell-to-collection assignments;
  - creating a second layer having cell-to-partition assignments;
  - creating a third layer having communication-requirements-to-partition assignments; and
  - creating a fourth layer having partition-to-server assignments.

4. The method of claim 2 further comprising the step of:

responsive to receiving an instruction from a communication program, using a rules engine to create a new map graph.

5. The method of claim 1 wherein the step of automatically re-mapping the system when a threshold has been exceeded further comprises the steps of:

monitoring a plurality of edge communications;

extracting data from the edge communications;

calculating a threshold  $T(c)$ ;

comparing  $T(c)$  to  $T$ ; and

responsive to  $T(c)$  being greater than  $T$ , sending an instruction to a re-mapping program to cause a map graph to be re-calculated.

6. The method of claim 4 further comprising the step, responsive to receiving confirmation that a new map graph has been calculated, modifying a map address book.

7. The method of claim 4 further comprising the step, responsive to receiving confirmation that a new map graph has been calculated, modifying the client address book.

8. The method of claim 1 wherein the step of creating a map graph further comprises: applying a template to a graph to create the map graph.

9. The method of claim 1 wherein the step of re-mapping the system further comprises:  
using a rules engine to re-calculate the map graph.
10. The method of claim 5 wherein the map graph is re-calculated using existing servers.
11. The method of claim 5 wherein the map graph is re-calculated to add a new server.
12. The method of claim 5 wherein the map graph is re-calculated to delete an existing server.
13. The method of claim 11 wherein the new server is added by creating a partition.
14. The method of claim 12 wherein the existing server is deleted by deleting a partition.
15. A method comprising:  
using a mapping program, creating a map graph for a client-proxy  
telecommunication system;  
using a communication program, creating a communication graph; and  
responsive to an instruction from the communication program, re-  
calculating the map graph to create a new map graph for the system.
16. The method of claim 15 further comprising the steps of:  
creating a first layer having cell-to-collection assignments;

creating a second layer having cell-to-partition assignments;  
creating a third layer having communication-requirements-to-partition assignments;  
creating a fourth layer having partition to server assignments;  
monitoring a plurality of edge communications;  
extracting data from the edge communications;  
calculating a threshold  $T(c)$ ;  
comparing  $T(c)$  to  $T$ ; and  
responsive to  $T(c)$  being greater than  $T$ , sending an instruction to a mapping program to cause a map graph to be re-calculated.

17. The method of claim 15 further comprising the step, responsive to receiving confirmation that a new map graph has been calculated, modifying a map address book.

18. The method of claim 15 further comprising the step, responsive to receiving confirmation that a new map graph has been calculated, modifying the client address book.

19. The method of claim 15 wherein the step of creating a map graph further comprises applying a template to a graph to create the map graph.

20. The method of claim 15 wherein the step of re-calculating the map graph further comprises:

using a rules engine to re-calculate the map graph.

21. A program product operable on a computer comprising:

a computer-usable medium;

wherein the computer usable medium comprises instructions for a computer to calculate a map graph having a first layer, a second layer, a third layer and a fourth layer; wherein the first layer contains cell to collection assignments, the second layer contains cell to partition assignments, the third layer contains communication requirements to partition assignments, and the fourth layer contains partition to server assignments;

monitoring a plurality of edge communications;

extracting data from the edge communications;

calculating a threshold  $T(c)$ ;

comparing  $T(c)$  to  $T$ ; and

responsive to  $T(c)$  being greater than  $T$ , sending an instruction to a re-mapping program to cause a map graph to be re-calculated.

22. The method of claim 21 wherein the step of calculating a map graph further comprises:

applying a template to a graph to create the map graph.

23. The method of claim 21 wherein the step of re-calculating the map graph further comprises:

using a rules engine to re-calculate the map graph.

24. The method of claim 21 further comprising the step of:

responsive to receiving confirmation that a new map graph has been calculated,  
modifying a map address book.

25. The method of claim 21 further comprising the step of:

responsive to receiving confirmation that a new map graph has been calculated,  
modifying the client address book.

26. An apparatus comprising:

an internal network connecting a communication system, a mapping system and a  
plurality of applications and servers;

a proxy server connected to the internal network;

a plurality of clients connected to the proxy server by an Internet;

means for calculating a map graph comprising cells, collections and partitions and  
for re-calculating the map graph when a calculated threshold  $T(c)$  exceeds a threshold  $T$ ;

and

means for creating a communication graph.

27. The apparatus of claim 26 further comprising means for modifying a map address  
book.

28. The apparatus of claim 26 further comprising means for modifying a client address book.

29. The apparatus of claim 26 further comprising a template.

30. The apparatus of claim 26 further comprising a rules engine.

31. A system comprising:

- an internal network connecting a communication system, a mapping system and a plurality of applications and servers;

- a proxy server connected to the internal network;

- a plurality of clients connected to the proxy server by an Internet;

- means for mapping a graph and creating a map graph; and

- means for automatically re-mapping the system when a threshold value has been exceeded; wherein the map graph further comprises: a first layer having cell-to-collection assignments; a second layer having cell-to-partition assignments; a third layer having communication-requirements-to-partition assignments; and a fourth layer having partition-to-server assignments.

32. The system of claim 31 wherein the mapping system further comprises means for, responsive to receiving an instruction from a communication program, using a rules engine to re-calculate the map graph.

33. The system of claim 31 wherein the communication system further comprises:

means for monitoring a plurality of edge communications;

means for extracting a data from the plurality of edge communications;

means for calculating a calculated threshold;

means for comparing the calculated threshold to a threshold;

means for, responsive to the calculated threshold being greater than the threshold, sending an instruction to a re-mapping program to cause the map graph to be re-calculated; and

means for, responsive to receiving confirmation that a new map graph has been calculated, modifying the address book.

34. The system of claim 31 wherein the means for mapping a graph further comprises applying a template to a graph to create the map graph.

35. The system of claim 31 wherein the means for re-mapping the system further comprises using a rules engine to re-calculate the map graph.

36. The system of claim 31 further comprising:

means for a map address book; and

means for modifying the map address book.

37. The apparatus of claim 31 further comprising:



a client address book; and

means for modifying the client address book.

38. The apparatus of claim 31 further comprising means for re-calculating the map-graph using existing servers.

39. The apparatus of claim 31 further comprising means for re-calculating the map graph to add a new server.

40. The apparatus of claim 31 further comprising means for re-calculating the map graph to delete an existing server.

41. The apparatus of claim 39 further comprising means for adding a new server by creating a partition.

42. The apparatus of claim 40 further comprising means for deleting the existing server by deleting a partition.